

REMARKS

By this Amendment the specification has been amended on page 14 to refer to the user's treading motion and the resistance thereto provided by the flywheel and the braking apparatus, claims 1, 32, 33, 40, 42, 46, 49 and 52 have been amended to address the examiner's formality rejections thereagainst, and new claims 53-60 have been added to define further features of the invention (support can be found on pages 10-12 of the specification). Entry is requested.

In the outstanding Office Action the examiner has rejected claims 1-3, 9, 32, 33 and 40 under 35 U.S.C. 103(a) as being unpatentable over Whalen in view of Cooper; he has rejected claims 4, 5 and 42-45 under 35 U.S.C. 103(a) as being unpatentable over Whalen in view of Cooper and Thornton; he has rejected claims 46-48 (52) under 35 U.S.C. 103(a) as being unpatentable over Whalen in view of Cooper, Thornton and Weyergans.

The inventor vigorously asserts that these rejections are incorrect! His comments follow.

Summary of Applied References

The disclosure in Whalen has been summarized previously. Whalen is directed to an exercise method and device for walking or running in the microgravity of space or in a hypergravity hypogravity simulation on earth (col. 1, lines 52-60). Towards this end, two alternative devices are

disclosed, namely (a) a pressure chamber sealingly engulfing the upper half of a person's body and (b) a pressure chamber sealingly engulfing the lower half of the person's body. Of these two devices, only device (b) is pertinent art to the present invention.

Device (b) has two modes of operation – the simulation of walking or running in hypogravity (i.e., a gravity lower than the gravity surrounding the device) and the simulation of walking or running in hypergravity (i.e., a gravity higher than the surrounding gravity). Device (b) simulates walking or running in hypogravity if the pressure chamber is loaded with a pressure above the ambient pressure, i.e., a high pressure. This loading has two effects: (1) the blood is pushed out of the extremities that are subject to the high pressure and (2) a pressure force is generated which tries to push the body out of the pressure chamber, thus reducing the weight of the body. The first is said in Whalen to be a cardiovascular effect (cf. col. 6, lines 37-44), the latter a muscoskeletal effect (cf. col. 8, line 67). Both effects combined simulate the effects of low gravity where the static blood pressure in the lower extremities is reduced and there is less body weight resting on the legs.

Device (b) simulates walking or running in hypergravity if the pressure chamber contains a pressure that is lower than the ambient pressure, i.e., a low pressure. In this case, (1) the blood is sucked into the extremities in the pressure chamber by the lower pressure and (2) a pressure force is generated which tries to suck the body into the pressure

chamber, thus increasing the body weight on the legs. Thus, the effects of hypergravity are simulated by an increased blood flow to the lower extremities on the cardiovascular side and by an increased load on the legs on the muscoskeletal side.

Again, those two effects combined are necessary to simulate the effect of hypergravity correctly.

The devices of Whalen may also be used to therapeutical purposes and replace known techniques such as water immersion and parallel rails that have been commonly used to reduce the level of force on the body (col. 8, lines 36-38). For this purpose, the device of Whalen will be used to simulate hypogravity, where walking and running can be performed at reduced levels of muscoskeletal loading as the gravitational force of body weight is reduced (col. 8, lines 4-8).

The concept of using a seat as in the present invention contradicts the teachings of Whalen which are directed to the simulation of gravity while running or walking and rely on the combined effects of blood flow and weight carried by the legs. According to the teachings of Whalen, it is necessary for the simulation of gravity that the person uses a standing posture so that eh body weight is carried by the legs.

From this it follows that, contrary to examiner's comments on page 5, last sentence, of the outstanding Office Action, if a person is too weak to stand on her own, Whalen teaches to use an increased level of

hypogravity, i.e., a higher pressure in device (6) to reduce the body weight.

Cooper discloses a cabinet for an exercising apparatus. In the cabinet, the exercising apparatus and a heat and vapor generating means are arranged. The cabinet is in the form of a casing or a box-like structure made in two main parts adapted to be joined together (page 1, lines 72-75). A back of the cabinet casing is formed by two doors (page 1, lines 81-82). The two casing sections are fastened together by battens (page 1, lines 92, 93). There are no means for an air-tight sealing of the casing.

The cabinet has an opening through which the upper body of a person using the exercise apparatus extends. The opening is provided with a cover made of canvas (page 2, line 19) and reaching up to the person's neck (page 2, line 59). The cover further has a slit and an armhole through which the person may thrust an arm (page 2, lines 65-73).

Cooper neither discloses an airtight housing nor a device for producing differential pressure in a pressure chamber as does the claimed subject matter.

In the Office Action the examiner states that, once vapor is generated by the heat and vapor generating means, the pressure increases within the cabinet. This statement lacks any basis in the reference: First, to effectively create an increased pressure within the

cabinet, a significant amount of water would have to be vaporized – certainly more than shown in the bowl of Fig. 1 of Cooper. Second, and more important, there are no means disclosed in Cooper that explicitly or impliedly indicate that an increased pressure can actually be contained within the cabinet. Rather, the use of a wooden multi-piece cabinet and the use of a canvas cover having armholes and slits immediately suggests to a person of ordinary skill that the cabinet is not pressure tight and that any pressure difference between the cabinet interior and its surroundings will immediately be equalized.

To the person of ordinary skill the teachings of Cooper stop at providing a sauna enclosure for an exercising apparatus. A sauna is not a pressure chamber.

Thornton relates to another method and apparatus for simulating gravitational forces. According to the teachings of Thornton, a series of negative constant pressures is externally applied to circumferential sections of a lower limb of an organism, in particular the legs of a human person. The applied pressure decreases with the distance of the respective limb section from the heart (cf. Abstract).

In particular, Thornton discloses a trouser-like garment with a number of successive, respectively fluid-tight compartments, which are disposed at increasing distances from the heart (cf. col. 5, line 5). The compartments extend generally transversively with respect to the longitudinal dimension of the garment, encircling parts of the legs

respectively (cf. col. 5, lines 29-42). Control means are provided that apply negative pressures to the compartments and maintain the pressures at incrementally different levels in respective ones of the compartments (col. 3, lines 45-49), col. 5, lines 53-55). Thus, an approximation of the gradient of negative external pressures to the normal gradient of hydrostatic pressures in the lower body of a standing person at the earth's atmosphere is simulated when the various sections are kept at different pressures. According to the teachings of Thornton, a maximum pressure of -12 to -30 mm Hg (-0.016 to -0.04 bar) is maintained adjacent the trunk of a person, and a minimum pressure in the range of -80 to -150 mm Hg (-0.1 to -0.2 bar) is to be maintained close to the feet of the person to approximate the effect of gravity (col. 5 to col. 10, line 3).

Weyergans maintains that cellulite can be reduced if the body or a part of the body of a person is exposed to alternating high and low pressure.

For this, the body or a part of the body of the person is received by a gas-tight chamber in which the pressure is alternatively lowered by 35-80 millibar and elevated by 20-60 millibar relative to the atmospheric ambient pressure. The time span in which the pressure in the chamber alternates between its minimum and its maximum is in a range of 20-120 seconds (col. 5, lines 17-23). The time period at which each of the pressure lower than atmospheric pressure and the pressure greater than

the threshold pressure, i.e., a pre-selected level of low pressure (col. 4, lines 18-19), is any amount of time in the range of between 2 seconds and 10 seconds (col. 5, lines 23-26). There is no explicit or implied disclosure, in which posture the body is received in the chamber.

Combination of Whalen and Cooper

In the pending Office Action the rejection of all independent claims relies, in its core, on a combination of the prior art references of Whalen and Cooper.

However, if one carefully applies the steps laid out in MPEP 706.02(j) one has to inevitably conclude that the claimed subject matter is not rendered obvious by this combination, as there is no motivation to combine the references of Whalen and Cooper. The examiner has failed to explain conclusively why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification. The reference teachings are not sufficient for one ordinarily skilled in the relevant art having the reference before him to make the proposed combination, *In re Linter*, 458, F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

The mere fact that references can be combined or modified does not render the result and combination obvious unless the prior art also suggests that desirability of the combination; *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). The proper enquiry is whether there is

something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination, not whether there is something in the prior art as a whole to suggest the combination is the most desirable combination available (*In re Fulton* 391 F.3d 12-01 73 USPQ2d 1145-1146 (Fed. Cir. 2004)).

In this case at hand, the subject matter of each independent claim differs over Whalen in that a seat is provided to support the body weight (the further limitations are discussed below).

Thus, in hindsight, a person of ordinary skill would, at the time of the invention, have had to use a seat within the pressure of Whalen to come up with the claimed subject matter. As explained above, the teachings of Whalen alone do not suggest the desirability of having a sat in the pressure chamber; rather, Whalen teaches away from any support of body weight in the pressure chamber.

If, at the time the invention was made, a person of ordinary skill starting from Whalen and seeking to improve its teachings considers the teachings of Cooper, he will note that use of the seat of Cooper will contradict the teachings of Whalen as, with the seat, gravity cannot be simulated anymore. Cooper itself does not provide any suggestion or motivation that it is beneficial to use the seat-supported exercise apparatus in an airtight pressure chamber instead of in a sauna cabinet. Thus, Cooper does not contain any information that overcomes the teachings of Whalen not to use a seat in the pressure chamber.

Rather, starting from Whalen, a person of ordinary skill in the art would only look at the heat and vapour generating means of Cooper as being desirable in the pressure chamber to provide an additional sauna effect. This is compliant with the temperature and humidity circulation unit shown in Fig. 5a of Whalen. Thus, a combination of Whalen and Cooper at the time of the invention would have resulted in the realisation of the person of ordinary skill that a sauna may be desired in the device of Whalen to increase the cardiovascular effect.

Thus, the subject-matter of the independent claims of my client's application is not rendered obvious by a combination of Whalen and Cooper.

Combination of Whalen, Cooper and Thornton (claims 4, 5, 42 to 45 and 49 to 52).

In the outstanding Office Action the examiner further combines Whalen, Cooper and Thornton to argue that this combination renders obvious the subject matter of claims 4, 5, 42 to 45 and 49 to 52.

In claims 4, 5 and 42 to 45, the additional limitation is included that "the pressure is switched to a higher pressure once a pressure reduction in the pressure chamber compared to the ambient pressure by 0.2 is reached".

As stated by the examiner under Section 8 of the pending Office Action, Whalen only discloses a reduction in pressure in the range of

0.013 bar to 0.133 bar. The examiner points to Thornton, where a reduction in pressure of 0.2 bar is supposedly disclosed.

However, Thornton uses the negative pressure in a completely different context: First, Thornton does not use an alternating pressure as the subject-matter of claims 4, 5 and 42 to 45 but only a constant negative pressure. Second, the constant pressure is only provided in a small section at the feet of the person, the remaining part of the body is loaded with lower (constant) negative pressures that decrease from the feet in the direction of the heart. Third, Thornton does not use a single pressure chamber which encloses the body of a person and houses an exercise means but a trouser-like garment having pressure chambers.

Thus, there is nothing in Thornton that suggests switching from a pressure decrease to a pressure increase once a limit of 0.02 bar is reached in a pressure chamber with an exercise means and in an alternating pressure environment. It is essential to the teachings of Thornton to use a negative pressure that is constant. To simulate the hydrostatic pressure gradients that exists in a gravity field. None of these teachings is compatible with the teachings of Whalen, where a pressure chamber with an exercise device for running or walking is used to simulate gravity.

If a person of ordinary skill, at the time of the invention, would have started from Whalen and would have looked for means to improve the apparatus shown therein, he would not have found any suggestion in

Thornton to use a differential pressure of from 0.02 bar to 0.2 bar (claim 4), 0.05 bar to 0.15 bar (claim 5), 0.02 bar to 0.05 bar (claim 42 to 45) as pressure link for switching pressures in an alternating pressure requirement. Whalen states that a negative pressure of 0.067 bar will already lead to a simulated body weight being 1.5 times the normal body weight (column 7, line 38-44). Thus, the pressure level shown in Thornton will lead to physiologically unacceptable conditions in the pressure chamber of Whalen.

Concerning claims 49 and 52, which contain the additional limitation that "said treading resistance is coupled to said interval switching such that the treading resistance increases while said low pressure acts on said user," the examiner states that Cooper discloses an adjustable treading resistance. It would have been obvious to couple the resistance of Whalen's apparatus under section 11 of the pending Office Action.

There is no prior art reference which teaches coupling the interval switching of the pressure of the treading resistance.

It is kindly noted that Whalen explicitly only teaches adjusting the training effect by altering the pressure in the pressure chamber: the level of force is easily regulated to provide a range of exercise conditions" (column 5, lines 53, 54). "It may provide advantageous for both draining and rehabilitation to load musculoskeletal tissue to high levels (hypergravity simulation) to stimulate an increase in muscle and bone mass, but minimize joint trauma, and the reduce the level of force to hypogravity

levels for longer durations in order to provide metabolic exercise and low force joint motion" (column 9, lines 40-48).

Whalen does not teach increasing the treading resistance while the low pressure acts on the user. Quite the contrary: as in Whalen, a pressure decrease automatically increases the force acting on the user, there is no need for an increase in the treading resistance.

Claim 33

With respect to method claim 33, the following remark may be made: Method claim 33 contains the additional limitation that first the circulatory system of said person is stimulated by using the workout device, then a pressure below atmospheric is generated.

First, this feature is not disclosed in any one of the prior art documents cited by the examiner. Thus, this additional limitations is not prima facie obvious from the prior art.

Second, the additional limitation of first stimulating circulation and then decreasing pressure is not implied by Whalen (the other references are further off). If one considers the use of Whalen's device for therapeutic purposes, Whalen specifically points out (column 9, line 40ff) that low pressure in the pressure chamber is used for patients that cannot support themselves due to a trauma. In this case, Whalen will always first have to reduce the pressure for the reduction of body weight and then to start circulatory training.

New Claims 53-60

The new claims contain additional features that have not been disclosed in the prior art currently of record.

New claim 53 contains the additional limitation that the treading resistance is set between 0.8 and 2.0 Watts per kilogram body weight. There is no disclosure in the cited prior art of such a training resistance in an alternating differential pressure environment. Moreover, even if such a resistance should be known from exercise devices that are not arranged within a pressure chamber, it would not have been obvious to a person of ordinary skill to use such a treading resistance also for the training in a pressure chamber around the waist.

New Claim 54 contains the limitation that the treading resistance is decreased if the seat position is moved from low to high.

New claims 55 and 56 contain the additional limitation that a monitoring means is provided that monitors the treading motion and either stops power supply to the pump (claim 55) or opens at least one valve (claim 56). There is no disclosure of this feature in the cited prior art. The corresponding feature depending on method claim 33 is included in new claim 60.

New claim 57 contains the feature that the resistance of the workout means is coupled to the change in pressure. As explained above, this feature is not disclosed or suggested in the prior art. Claims 58 and 59 contain an analogous additional feature of the method claim 33.

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Conclusions

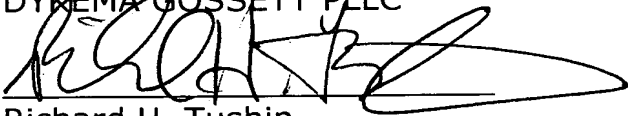
The examiner's rejections should be withdrawn and all the claims allowed.

The additional government claims fee should be charged to Deposit Account No. 04-2223.

Respectfully submitted,

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